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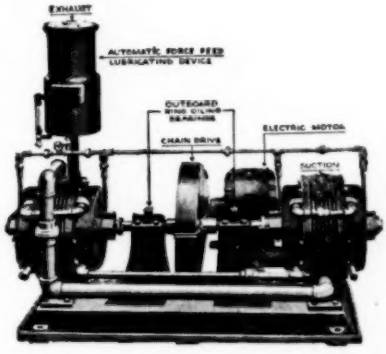

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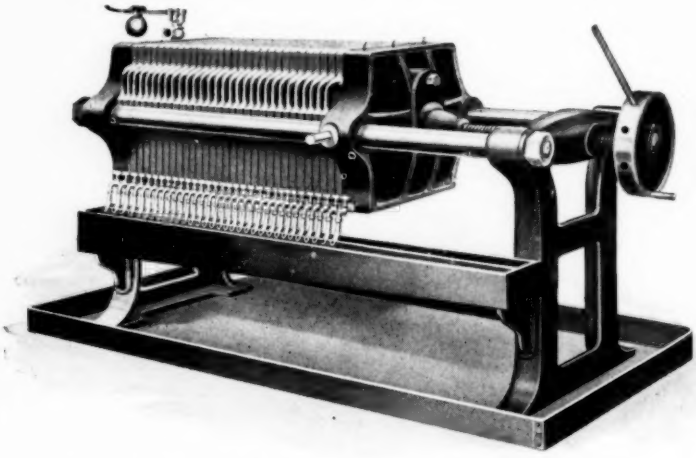

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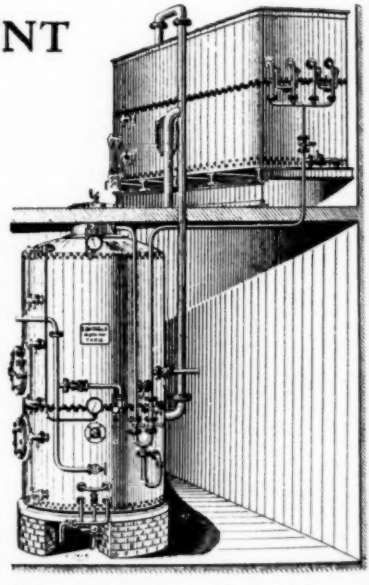

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OIL & FAT INDUSTRIES

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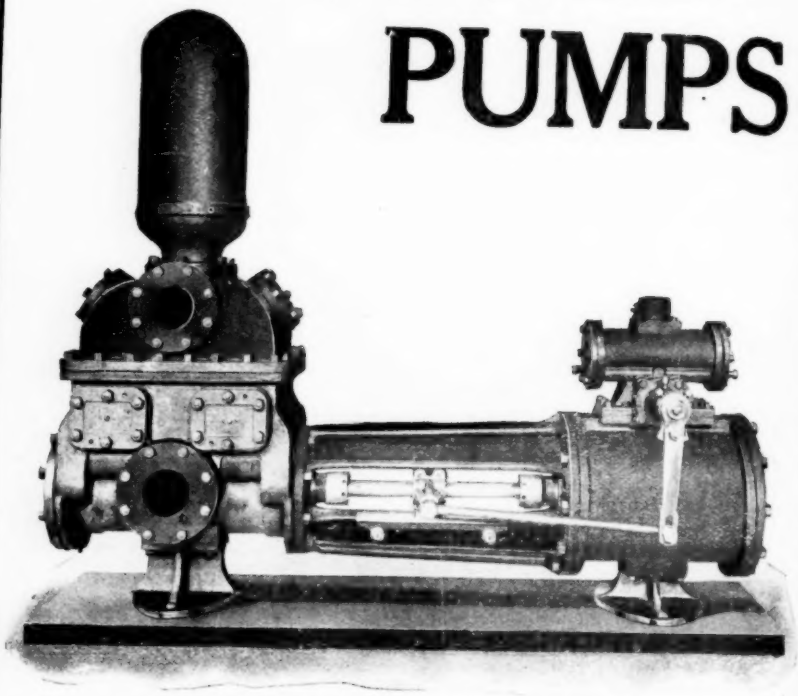

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OIL & FAT INDUSTRIES

VOLUME V JUNE, 1928 NUMBER 6

Progress Keynote of New Orleans Convention

THE Nineteenth Annual Convention of the American Oil Chemists' Society was held at New Orleans, May 14th and 15th, 1928, and was the largest and the best convention ever held. All the meetings were well attended, keen attention was given to all committee reports, and many progressive steps were taken.

Among the most important of these was the action taken in regard to referee chemists. Heretofore, the payment of dues in the Interstate Cottonseed Crushers' Association was a prerequisite, and entailed the moral responsibility of implying that anyone given a referee certificate was *ipso facto* a referee chemist of the Interstate Cottonseed Crushers' Association. This was confusing and embarrassing to both Associations, so this year the Society eliminated this requirement and decided to raise the standards by granting a Full Referee Certificate covering all products handled by our methods to all future applicants, but requiring a four year college course in chemistry and three years' practical experience in addition.

Another very important step was the adoption of the moisture oven. Ever since the Society was organized in 1909, the question of moisture determinations has been unsettled. Ten years ago Dr. Smalley came to the conclusion that the adoption of some oven, with a standardized procedure, was most satisfactory. Since then the Swift Laboratories under the able leadership of Dr. W. D. Richardson, and W. H. Irwin have perfected a glycerine oven, and have obtained a manufacturer for it at a reasonable figure ($150.00) either in copper or monel metal. The Society adopted this oven as official with the temperature of 102° C and the time of three hours as standard.

Revision Committee

The Revision Committee under the able leadership of Mr. Cluff has completed the work of revising the methods by eliminating all references to rules of the Interstate Cottonseed Crushers' Association, etc., and by having them in shape to print. These will be issued later as a separate pamphlet at a reasonable price.

The Society also took another

very important step forward by arranging to cooperate with the Interstate Cottonseed Crushers' Association in research work. When committees are formed to handle such work, the work has to be done in spare time, and such time is necessarily limited. Two years ago, Procter & Gamble very generously furnished Mr. Cluff with a man for six months, and the results obtained by him were invaluable in putting our refining procedure on a definite basis. It is the idea of the Society and the Interstate Association, that if a man is put on problems he can work out the fundamental facts underlying them. Then this data can be transmitted to the proper committee for modifications, and transmitted to the Society.

Membership Grows

The report of the Membership Committee was very encouraging, showing a healthy growth for the first time in many years.

The paper of Dr. E. P. Clark was very interesting, showing Dr. Clark's grasp of the fundamental problem of gossypol, and his very careful and accurate work in solving the problem. The question of the real character and formula of gossypol is a very complex one and will require considerable time to fully answer, and Dr. Clark's rapid progress is very commendable.

The Corn Oil Committee gave a very comprehensive report of the work done under its able Chairman, Mr. Durkee, that illustrates the fact that the Society is no longer strictly a cottonseed products chemists' society.

The report of the committees on the effect of crude mill operations on the crude oil produced was exceptionally interesting, and shows the results of much work on the part of Mr. Schwartz and Mr. Ganucheau.

The paper of one of our past Presidents, Mr. G. G. Fox, on the refiners' problems with oil purchases was very instructive, and was well received.

Dr. Jamieson discussed Avocado Oil in a very interesting manner.

Dr. H. B. Battle discussed the Smalley Foundation in his very interesting paper "The Smalley Foundation: what it is supposed to do: what it has done," giving a very able history of the check meal work, and then announced the winners as follows:—

Ammonia Certificates — First Place. Southwestern Laboratories, Dallas, Texas. George K. Redding, Rossford, Ohio. Average 99.979%

Second Place. W. R. Austin, Nashville, Tenn. Average 99.965%

Oil Certificates—First Place. E. H. Tenent, Memphis, Tenn. Average 99.92%

Second Place. L. B. Forbes Laboratories, Memphis, Tenn. Average 99.895%

Oil and Ammonia Average—First Place and winner of the Cup. E. H. Tenent, Memphis, Tenn. Average 99.934%

Second Place. L. B. Forbes Laboratories, Memphis, Tenn. Average 99.919%

Color Reading Tests

Mr. Priest and his two associates, Dr. Judd and Miss Walker, with the assistance of the members, notably Miss Norris, Mr. Helm, Mr. Williams, Mr. Harriman, Mr. Ganucheau, and Dr. Battle, tested some fifty of our members for their ability to read colors, and their sensibility to slight changes in red when added to 35 yellow 7.6 red in the Martin's photometer

under the standard conditions.

Mr. Priest also reported to the Society on the Cooperative Investigation of Lovibond glasses by the Bureau of Standards and The American Oil Chemists' Society, and Miss Walker described the actual details of calibrating Lovibond glasses.

Dr. Wesson discussed the prize awards and announced that all papers submitted before April 1st would be considered whether printed heretofore or not, and announced the appointment of three judges to consider the papers, namely Dr. Charles Herty, Dr. C. A. Browne and Dr. Allen Rogers.

The President of the Society, Mr. H. P. Trevithick, presided over the deliberations of the convention, and appointed an Auditing Committee, a committee on the President's address, a special committee of one, Dr. Wesson, on the death of our old friend and associate, Mr. Robert Hulme, of Los Angeles, and a Nominating Committee.

President Thanked

The Auditing Committee, Charles Cox, Chairman, reported on the conditions of the books of the Secretary-Treasurer, Mr. Helm, and complimented the Society on his careful handling of its affairs.

The Resolutions Committee, Dr. Battle, Chairman, brought in a very careful report which was adopted in toto.

The committee on the President's address, Mr. Porter, Chairman, reported on the vote and included a vote of thanks by the Society to the President, Mr. H. P. Trevithick, for his capable work in guiding the Society during the year.

The Uniform Methods Committee, Mr. Hammer, Chairman, considered all committee reports with appropriate action, including the recommendation that the FAC Committee consider the Olive and Linseed Oil reports as being under their special jurisdiction.

Mr. David Wesson offered a very fitting set of resolutions on the death of Robert Hulme.

The Nominating Committee, Mr. J. J. Vollertsen, Chairman, reported the following nominations.

A. W. Putland, President
W. R. Stryker, 1st Vice-President
C. K. Witmer, 2nd Vice-President
W. H. Irwin, 3rd Vice-President

The Governing Board had already nominated J. C. P. Helm to succeed himself, and as there were no further nominations from the floor, these men were accordingly elected.

Banquet Closes Meeting

The culminating feature of the convention was the banquet at the Chess, Checkers and Whist Club, ably engineered by Mr. Williams and his local committee, and presided over in his usual witty fashion by Dr. David Wesson. During the banquet, attended by 125 or more, there were musical entertainments, and also short talks by Messrs. J. J. Vollertsen, W. H. Irwin, C. B. Cluff, and Dr. Felix Paquin. The President, H. P. Trevithick, then presented the certificates to the Smalley Foundation winners, and the Battle Cup of the Smalley Foundation to Mr. E. H. Tenent of Memphis, who had the remarkable average of 99.93%. He then presented the Battle gavel to our new President, Mr. A. W. Putland, who accepted it with a few well-chosen words.

Address of the President

LAST year at Memphis you honored me by electing me to the highest office in the Society. At this time it is necessary that I should give a report of the year's activities and such this paper will be, rather than an address.

The past year's work has been rather strenuous and has been divided into several groups. The first comprises the usual routine appointments, such as committees, etc. This year we have appointed in addition to the usual committees, the Olive Oil, Linseed Oil and Sampling Committees. This last committee was appointed simply to consider whether any of the present sampling devices in use comply with the requirements of the Interstate Cottonseed Crushers' Association rule, and if not, to see if it is possible to design such a sampler. The Planning Committee also has been completely revamped with the idea of having each man represent some particular group in the industry, the idea being that this Planning Committee will be a sort of permanent committee, with the Chairman keeping the records and supervising the work of all committees, while the particular individuals assigned to any industry would have more or less supervision over the work of the committees in his particular line. In this work I have had the most cordial co-operation of every member in the Society, and I wish to thank them for it.

At this time in connection with the subject of committees I might say that the Chairman of the Detergents Committee, Mr. Hoyt, found it impossible to continue to serve as Chairman, and it was necessary to find a new Chairman. I wrote every member of that committee regarding the matter, and the interest displayed in the face of the many obstacles confronting that committee was very surprising. The problems assigned to that committee are almost unsolvable, and yet every member was interested in the work and felt that the work should continue, whether the results were negative or positive. Mr. Guernsey of the Cowles Detergents Company accepted the Chairmanship, provided his assistant, Mr. Howell, could be Vice-Chairman.

The reports of all these committees will be given in due course at this meeting.

Fall Meeting

Another division of the work was the fall meeting of the Society in New York last October. This meeting was well attended, there being fifty or sixty present, with members from points as far as Dallas, Chicago, Atlanta, New Haven, Washington, etc., and the interest displayed was very encouraging. One fact developed from this meeting which was very surprising to myself, and that was that there are between thirty or forty members of the Society in the Metropolitan District. It would seem advisable to have a meeting at least once a year somewhere in the Northern section of the country, in order that the northern members could attend more conveniently. At this fall meeting preliminary reports of most of the committees were presented. Also the Fat Analysis

Committee had a very interesting meeting under the leadership of Dr. Richardson.

The Revision Committee has completed the work of editing the methods and taking out everything that does not strictly belong in them, such as Interstate Cottonseed Crushers' Association rules, etc., so that they are now ready to be published, and the Society should consider at this meeting the question of how they should be published, the cost, etc.

Also the Moisture Committee has more data on the glycerine oven, and will recommend this instrument as the official oven. I strongly recommend that this oven be adopted as official for the Society.

Progress on Color Standards

Finally and possibly the most important is the question of color and Lovibond glasses. As you will remember last year, Mr. Priest reported that he had finished the preparation of the fundamental standards for the red Lovibond glasses. The question of how they were to be used and who would do the standardizing of our glasses was left to be settled by correspondence later. Mr. Priest returned to Washington; took this matter up with several concerns and the net result was that while they were willing to undertake this matter, there was considerable preliminary work which had to be done by the Bureau of Standards irrespective of who actually calibrated the glasses. This preliminary work consisted of finding glasses which were as nearly as possible whole units or whole fractions of units, and also of preparing the instruments to be used in standardizing the glasses.

As a preliminary Mr. Priest offered to examine all red glasses which should be submitted between 7 and 8, and pick out any which read actually 7.6, and he also promised that he would examine all 35 yellows submitted. We, therefore, submitted to him 200 glasses, about 125 reds and 75 yellows and he started his examination. This was not entirely satisfactory to the Society, however, as it did not insure getting our glasses standardized, and so the Bureau offered us the use of the facilities of the Bureau, provided we furnished a research associate to do this work, as the Bureau of Standards had neither the personnel nor the appropriation to expend on it. The Governing Board, therefore, decided to employ Miss Geraldine Walker and placed her in the Bureau. Mr. Priest then enlarged his program and not only picked out the actual 7.6 red glasses and accurate 35 yellows from those submitted, but actually graded all the glasses submitted, a tremendous amount of labor.

The reds were finished in the fall, and were returned to their owners in the early winter. For the yellows, however, Mr. Priest found it necessary to establish the fundamental standard as this had not been done heretofore, with the result that these glasses were not finished until late in the winter, and were returned to their owners in February or March.

Due to this work and the preliminary work necessary before calibration could be started, it was January 15th before we could submit glasses to Miss Walker for standardization. Mr. Putland with the earnest co-operation of his employer, Mr. Herman Aspegren, consented to handle this matter, and has received all glasses for stand-

ardization. He then sorted them into lots of 25 which were as nearly as possible alike, and submitted them to Miss Walker. This work is now proceeding satisfactorily.

Research Associate

Referring again to the matter of the research associate, due to the fact that Miss Walker could not start work until about the first of February, the Society has been under considerable expense. Further, there are a number of other groups interested in these glasses, such as the Sugar and Turpentine Industries, the Paint & Varnish, and the Petroleum Interests. It would seem only fitting, therefore, that the Bureau of Standards should assume all financial responsibility for this standardization of glasses, as it is not proper that our Society should be responsible, particularly when so many other groups are interested. Further, the Bureau of Standards already does such work for many interests, charging reasonable fees for such work. We, therefore, endeavored to have the appropriation for the color division of the Bureau of Standards increased $5,000, and succeeded in getting this amendment through the Senate. However, through a misunderstanding it was refused by the House and failed in conference. We hope to get the matter through in the second deficiency bill, however, which will be considered by Congress very soon, and in that case the Bureau of Standards will have funds available to continue this work.

In considering the details of the expenditures for this work, please consider several facts: First, the 200 glasses originally submitted were calibrated free of charge; second, the necessity for preparing the instruments for use in matching glasses, also the necessity of finding accurate units and tenth unit glasses consumed much time; third, after the work of calibration was finally started, the speed of the work increased gradually through increasing familiarity with the methods, so that now our revenue of $1.50 a glass is about meeting expenses.

I, therefore, recommend that this work be continued, if necessary, until our glasses are standardized, unless of course, Governmental assistance is available before then. I also strongly recommend that the thanks of the Society be tendered by proper resolutions, to Dr. Geo. K. Burgess, Director of the Bureau of Standards, to Hon. Herbert Hoover, Secretary of Commerce, to Mr. Priest and his assistants for their co-operation. I also recommend that our thanks be given by proper resolutions to Senators Harris and Smoot and to Congressmen Oliver and Bacon for their assistance. Also, unless Congress appropriates this money to be available July 1st, I recommend that efforts be continued by the new Governing Board to get this increase through Congress next fall.

The various committees of the Society have all functioned very satisfactorily under the leadership of their respective Chairmen, and their reports will prove very interesting and profitable to the membership.

Our membership shows a very healthy growth this past year, due to the energetic leadership of the Chairman of the Membership Committee, and includes more men in allied lines.

OIL & FAT INDUSTRIES has continued to improve under the able direction of Mr. Lee, and we ex-

pect even greater improvement in the future.

Mr. Law, at a considerable sacrifice of time, has handled the preparation of the samples for the Smalley Foundation, and our thanks are especially due him and Mr. Moore for their able and painstaking work.

As I have said before I have had the utmost co-operation from every member of the Society, particularly from the Governing Board, and I wish at this time to thank them for their help, as without it, it would have been impossible to have handled the matters for the Society.

Our Secretary has been very efficient and has given me the most whole-hearted co-operation.

Planning Committee Delays Final Report

THE experience of the Planning Committee of the can Oil Chemists' Society is that the Convention is not the proper time to make a report; in fact, there is not much necessity to make a report. Its function, theoretically, is to advise and counsel other committees.

At the last moment this paper was made up at a time when reports from only fifty per cent of the committees had arrived.

Until the Planning Committee can have the full view of the situation and the desires of the membership at large, it is hardly in position to plan to the best advantage. It has, therefore, been thought best to postpone making any recommendations at this time but to hold a meeting of the incoming Planning Committee immediately after this convention, at which time it is hoped to meet with such chairmen as may be holding over or appointed by the incoming president, and then plan the work for the coming year. This suggestion has met with the approval of certain of our officers and will be tried out this year.

The planning of the work of the Society has always been a difficult question, and for this reason it is hoped that by having a personal conference with the various committee members more can be accomplished in an hour here than all the correspondence which has been lavished upon it in the past.

Congress Gives Money for Standardization of Glasses

An appropriation of $5,000 for the color division of the Bureau of Standards was passed by the last Congress and signed by President Coolidge, thereby enabling the division to add Miss Geraldine Walker, a research associate, to the staff. The color division will carry on the standardization of the Lovibond glasses of the American Oil Chemists' Society and will relieve the latter of all financial responsibility for such work. After July 1 all glasses should be sent direct to the Bureau of Standards, as neither the president nor the secretary of the society will have authority to handle them or to collect the necessary charges.

Commission Grants Stay on Removal of Labels

The Federal Trade Commission has notified the edible oil industry that it would be given until August 1, 1928, to dispose of all containers and labels which do not conform to the rules adopted by the industry at the trade practice conference held on December 9, 1927. This action gives members of the industry an extra three months to conform to the rules, for the previous order of the Commis-

sion stated May 1 as the date. The change in time was made by the Commission after several companies had requested that it be done.

Board Reports 28 Referees

AT the beginning of the 1927-1928 season, there were twenty-six referee chemists certified. During the year two have been added to this number, making a total of twenty-eight functioning at this time, according to the Convention report of the Referee Board of the American Oil Chemists' Society.

During the past year the Referee Board has passed upon four applications—one was passed for all products, another given a partial certificate, two were rejected.

At the present time, the Board has before it seven applications for certificates. Should all those now certified reapply and their applications be allowed and the new applications granted, there will be thirty-five referee chemists on the list.

Refining Committee Makes Ten Recommendations

The Refining Committee of the American Oil Chemists' Society, under the chairmanship of C. B. Cluff of the Procter & Gamble Company, has made ten recommendations that embody the essential points covered by its report to the recent convention at New Orleans. The recommendations are as follows:

1. On oils with free fatty acids not over three per cent, one of the tests shall be made with the maximum amount of the stronger lye, and the other two tests with eighty per cent of the maximum of the two respective lyes. On oils with free fatty acid over three per cent, two of the tests shall be made with the maximum amount of the two respective lyes, and the third test with eighty per cent of the stronger lye.

2. Omit the ten degree lye from the refining tables and change the required lyes for oils with less than one-and-a-half per cent F. F. A. from ten and fourteen degrees to twelve and fourteen degrees for Hydraulic oils, and from twelve and sixteen degrees to sixteen and twenty degrees for Expeller oils.

3. Limit the number of refining tests to the three specified in recommendation number one, thus eliminating the additional tests covered by sections (b) and (c) of rule 264.

4. Omit the permission to use intermediate strengths of lye between the two specified in the table, thus requiring only two strengths to be used by all operators on a given oil.

5. Change period of coal agitation from "ten minutes" to fifteen minutes for Hydraulic oils.

6. Change period of cold agitation from "thirty to sixty minutes" for Expeller oils to forty-five minutes in all cases.

7. Change period of agitation in the hot bath from eight minutes to twelve minutes in all cases.

8. The present refining procedure as amended by the above recommendations should be adopted for the coming year.

9. For next season further study should be made of the refining of cold pressed oil, corn oil, and other oils, and of the Natural Oil Method; also of the color of the oil recovered by re-melting the soap stock.

10. All purely development work of the committee should be put into the hands of an investigator who can give almost all of his time to this work for a sufficient period to determine the points involved. Arrangements for financing this work should be made by cooperation between the American Oil Chemists' Society and the Interstate Association. The committee feels that this method of handling development work is well justified, and that it is the only way in which the required information can be obtained and put into practical use within a reasonable time.

Trend of Chemical Research in the Oil Industry

A Resume of Recent Progress in the Chemistry and Technology of Glycerides

BY DAVID WESSON

BROADLY speaking, the chief work of today seems to be that of broadening our present knowledge of well-known processes with the end of introducing refinements and improvements rather than the development of new processes.

It is, perhaps, significant that at the St. Louis meeting of the American Chemical Society last month, there were no papers presented on fats and oils.

Improved analytical methods have given means for investigating the constitution of fats and oils not known a few years ago, and our literature contains, not only many reports on the constitution of well known oils, but also those which are comparatively rare. The painstaking methods of Jamieson of the Bureau of Chemistry in Washington are constantly bringing to light the properties of many oils hitherto unknown.

The discovery that the character of fats, using the term in its broadest sense, depends on the arrangement of the different fatty acids in the fat molecule has opened an almost limitless field for research, and the fat chemist of today realizes that the chemistry of the glycerides is an ever-widening field of interest.

Solvent Extraction

The method of solvent extraction is one which has already received much attention abroad, and is receiving more and more in this country. It is the ideal method of separating the oil from the seeds containing it. Take the cotton seed for instance, with our present method of pressing we leave in good practice 5.5 to 6.0 per cent of oil behind in the cake where it is available for cattle food or wasted if the meal is used for fertilizer. If the oil be extracted from the meats by proper solvents, and similar means be used for extracting the gums and gossypol this valuable protein residue can be made available as a meat substitute in human food and will greatly enhance the value of the seed as part of the cotton crop.

The future of solvent extraction depends on improved engineering methods combined with proper knowledge of different solvents.

Great advances are being made in the production of solvents by the petroleum refineries and the by-product coke ovens.

Refining Methods

In refining methods much has been learned about the proper application of alkalies. Our knowledge has been greatly increased by the notable researches of the refining committee of the American Oil Chemists Society.

The work done on the filtration of crude oils by the use of filter-aids is a step in the right direction. It is only common sense to remove all materials which can be

separated from the crude before treating it with caustic soda. The reason this has not been done until recently is because in the past filtration experiments on crude oils were attempted with unaided press cloths which allowed the slime to pass through with the oil. The result was almost as much emulsification and no gain in the refining loss.

In the matter of filtration of crude oils a great deal of work is being done investigating and improving filtering materials.

The clays treated with sulphuric acid produce some remarkable results as compared with the natural products. Referring to the latter, great improvements have been made by greater care in their preparation so that the refiner is assured of uniform products.

There are constant improvements taking place in the various carbons which, in the vegetable oil industry, have entirely supplanted bone-black.

In the deodorization of oils the trend seems to be toward better constructed machinery and a more scientific application of heat and of the basic principles of distillation.

The chemistry of the process seems to have been pretty welll worked out, and the future for improvement seems to rest on intelligent application.

In the process of hydrogenation much attention is being given to both continuous processes and selective hydrogenation. The latter is of especial importance in turning out uniform food products. The value of continuous processes over the batch method does not seem to have been fully demonstrated yet by practical use.

Synthetic fats by direct combinations of glycerides and fatty acids are now a possibility and under the right commercial conditions are available in times of scarcity. Considerable work is being done in synthesizing different glycerides on the laboratory scale, and the time may come when this work will lead to interesting developments commercially.

An enormous amount of work is being done with Vitamins. Several processes have been devised for separating fat-soluble Vitamins in such a form that they can be made available in food and medicinal products, so as to refute the argument that margerine is not as good as butter.

The work done by Hess and others has demonstrated pretty completely that anti-rachitic Vitamin D can be produced by the treatment of cholesterol and phytosterol with ultra-violet light. This product has the same anti-rachitic value as the Vitamin D found in Cod Liver Oil.

Recent research has developed the fact that Vitamin D can be commercially produced from ergosterol and it is now a commercial product available for either medicinal purposes or for bringing edible fats up to the same standard as butter fat insofar as Vitamin D is concerned.

There is considerable research being done in improving analytical methods which are constantly aiding and broadening the field of knowledge of the constitution of the glycerides.

It is believed that the future holds forth comparatively few revolutionary changes due to fundamental processes as stated before. Refinements and manufacturing improvements will give better products economically produced.

Problems of the Oil Refiner

A Discussion of His Relations to Buyers and Chemists

BY G. G. FOX

SEVERAL weeks ago the president of the American Oil Chemists' Society requested me to talk before the Society on the experiences of the Refiners' Division of the industry during the past season, and it occurred to me that there were many interesting things which we might discuss. From time to time different thoughts have passed through my mind concerning a means of presenting problems which have confronted us recently, and, while I seem to have discarded them one after the other, I still think, from a few bits of information collected from the industry, that some interesting results may be registered with you, and I hope may be of some assistance in your future plans for meeting the technical problems of the industry.

It seems only fitting at this time that we should approach the subject matter first by reviewing the past, and it is very gratifying to me today to look over this assembled group and visualize the progress and development which has taken place since the organization of this Society. It seems but a few years ago when an effort was made by just a few chemists connected with the industry in different capacities to devise a means of exchanging ideas which might be helpful, and I believe it was in Louisville when some eight or ten chemists met and discussed problems of that day, finishing with the thought and belief that a society could be organized and maintained thru the support of the Interstate Association, and be of great assistance in its field of endeavor. The following year in Memphis, your Society was instituted, first known as the Cotton Products Analysts Society and later to be known in a broader way as the American Oil Chemists Society. The co-ordinated efforts and contact of the members resulted in a wonderful understanding and a systematizing of methods and activities, which gave this organization a national standing and made it one of the most important divisions of the Interstate Association.

Much work has been done in the standardization of methods for the analysis of the various products of the crushing industry, not to speak of the unselfish and tireless efforts of your members in relation to perplexing problems which have come up from time to time in the Association, and the wonderful way in which this Society has grown and the manner in which each member is contributing is deserving of much credit, and I congratulate you today on your achievements.

Another branch of the Association, the Refiners Group, should also be reviewed, in relation to progress, in order that we may approach the present contact of chemist and refiner in a clarified way.

It is generally conceded that cottonseed oil is the most valuable product of the crushing industry, and the greatest outlet for this commodity is in the manufacture of shortening. It is interesting to

go back into the history of the shortening industry and to note how this outlet was developed and through what means it has reached its present stage. Therefore, I am going to relate the result of a survey on this subject, which I made a short time ago, and, while the statements may not be exactly accurate, in relation to dates, yet in a broad way it serves to tell the story of shortening.

In the early eighties the N. K. Fairbanks Company operated a large refinery in Chicago, in which it received prime steam lard purchased on the Chicago Board of Trade, which it subsequently refined, packed and shipped to the various markets of the world under its private brands. During this time, it was also the practice to press prime steam lard, utilizing the lard stearine for blending with prime steam and shipping to the tropics, and selling the prime lard oil to the railroads and signal oil blenders. This development suggested the use of a vegetable oil, and refined cottonseed oil found its way into pure lard, and various blends were made to satisfy the consuming demand in relation to texture, so that our first product involving the use of cottonseed oil was commercially known as "lard compound," in which oleo stearine was later used, about the time when oleo stock was pressed to produce oleo oil, to satisfy different market demands.

About 1884 the use of oleo fats in lard compound, together with cottonseed oil, attracted the packing industry, and in this year Armour and Company equipped its refinery with a shortening plant to become compounders of lard, cottonseed oil and oleo stearine. Some ten years following, other large packers entered this industry, which brings us up to 1894, from which time the manufacture of shortening increased tremendously, until we are brought up to date.

There were many problems in the early days for the chemist and refiner, in preparing cottonseed oil properly for this edible food product, and some of the old records in Chicago bear the names of Mr. Eckstein, who is credited with having developed mehods of bleaching cottonseed oil, with Dr. Wesson, who has probably done more in the development of present day refining, bleaching and deodorizing methods than any other one person in the industry. It, therefore, appears that the development work in those days was done through personal endeavor, and not on an organized basis of the present day.

It was the custom of the compounders to purchase refined cottonseed oil, delivered at Chicago in barrels, and later in tank cars. The trade customs were quite different than those which obtain today. Our own company contracted for their requirements of refined cottonseed oil with a prominent refiner on a cost plus basis, and there was no specification to set up the grade; but it was understood that cottonseed oil tenderable on the contract should be equal to the normal expectancy of the trade at that time, in relation to flavor and odor, and, if the refining loss exceeded the average refining loss for the season, the buyer was entitled to a reasonable claim which was made and paid.

It was the duty of the broker negotiating the transaction to supervise the movement of the seed to the crushing establishment and the oil to the refiner and to insure a fair average quality of oil. It

wasn't until 1896 that the first Association meeting was held, at which time suggestions were made to expedite trading through the adoption of a few so-called rules, even though no attempt was made to establish maximum refining losses.

About this time we are told that the industry was greatly agitated over the report of measuring the color of cottonseed oil with the use of a tintometer, which set up the utilization of color standards. Having established the refining loss and color standards, the rules were amplified to include them in establishing the grades which should be traded in, and to simplify means of setting up values for different grades. Later the rules disclosed the specifications for prime crude cottonseed oil, but a difficulty arose at this time, owing to the fact that a mill purchasing seed and desiring to sell the oil to be made from the seed for a future delivery was disappointed to find that the seed when crushed did not make a prime crude as defined by the rules, and therefore, a basis prime crude was presented for trading purposes.

The popularity of this custom caused the pendulum to swing the other way, and the refiner found that he was obliged to take anything that ran through a press, even though he had originally purchased a prime crude cottonseed oil, which was to make a prime summer yellow bleachable refined oil the basis or standard for vegetable shortening.

Again the refiner and chemist got together and thrashed out the difficulties surrounding the industry, in view of this broad ruling, and it was found necessary to establish a limit of grade for a basis prime tender. When this was accomplished, it seemed as though transactions would move smoothly, until we experienced a bad growing season, when off oil was produced quite generally throughout the belt, and our immediate problems were twofold: first, to establish the proper grade on a refined basis of this off crude, and second, to arrive at the proper value of the refined oil thus produced.

Again the chemist was asked to contribute, and you will recall much check work was attempted in the handling of these off oils that brought out an emergency plan for trading, whereby certain code words in the Yopp's Code Book set forth grades and settlement plans to expedite trading. We gradually come up to the next big movement in the Association's affairs, which has to do with the experience of the past season, whereby transactions were made on a debit and credit basis, or a premium for choice oil.

This involved considerable thought and study, and the plan was officially adopted—but the most important feature of the season was not contemplated when the rule was passed; that is, it was not expected that such choice oil would be made throughout the belt as seems to have been made this past season. Because the rules prescribed that a chemist's certificate (a member of this Society) should be rendered the seller upon the receipt of each tank of crude refined, it caused some members of the Society to handle a great deal more oil than ever before, and particularly choice oil, which they were not called upon to handle in the past.

In the early months of the season, the discrepancies reported between the chemists and the refiners

were so alarming that they promished to be extremely serious, for, officially, the refiner was obliged to pay for the oil on the basis of the chemist's certificate, and the chemist was reporting results which could not be obtained by the refiner. While this spread in the wrong direction for the refiner, it was somewhat lessened as the season progressed, it called for some emergency action, which was taken last November, and it resulted in a recommendation by the Chemists' Committee that the prescribed caustic treatment be reduced in strength to eighty per cent of the maximum given in the official method. This was doubtless a step in the right direction, but it would appear from some of the reports of the refiners that we might step further in this direction before approaching the economic status of this problem. Progress is expected this year.

Report of the Chevreul Prize Committee

BY DAVID WESSON, CHAIRMAN

THESE prizes were established in 1926, and named in honor of the great French Chemist Chevreul, who discovered that the vegetable and animal fats and oils consist of combinations of Fatty Acids and Glycerin.

They were offered for the three best original articles appearing in the Oil and Fat Industries Journal during the season 1926-1927.

At the meeting of the American Oil Chemists Society at Memphis 1927, it was decided to extend the time until April, 1928.

The Committee has decided that articles received up to April 1 but published at a later date would be eligible.

To be considered the articles must have practical bearing on the fat and oil industry and be of use to the same.

The competition is open to nonmembers of the society.

The judges selected are:

Dr. C. A. Browne, Chief, Bureau of Chemistry, United States Department of Agriculture; Dr. Charles H. Herty, Chemical Advisor, Chemical Foundation, New York, New York; Dr. Allen Rogers, Prof. Industrial Chemistry, Pratt Institute, Brooklyn, New York.

The prizes are as follows:

The first prize	$150
The second prize	100
The third prize	50

Referee Applicants

The following have applied for Certificates as Referee Chemists of The American Oil Chemists' Society; (second publication):

W. J. Bramblett, Texas Testing Laboratories, Fort Worth, Texas.

Industrial Laboratories, by H. M. Bulbrook and F. C. Schilling, Fort Worth, Texas.

A. H. Preston, Southwestern Laboratories, San Antonio, Texas.

H. M. Shilstone, New Orleans, Louisiana.

J. H. Sorrels, Terrell's Laboratories, Fort Worth, Texas.

Convention Proceedings

Summary of Deliberations of American Oil Chemists' Society at New Orleans

May 14 and 15, 1928

THE Nineteenth Annual Convention of the American Oil Chemists' Society was called to order by the President, Mr. H. P. Trevithick of New York, in the Roosevelt Hotel, New Orleans, Louisiana, at 9:30 A. M., May 14, 1928. After the meeting had been duly opened, the President had given his address, and the Secretary-Treasurer had presented his report, the President gave the report of the Governing Committee in which he discussed the question of Referee Chemists' certificates. He said in part, "We decided that two styles of referee certificates were to be issued, one to be a limited referee certficate and the other full. The limited referee certificate covers those who are at present holders of referee certificates, and will be issued to future applicants who wish to be certified on special limited products covered by the A.O.C.S. method. The full referee certificate is to cover all products coming under the official methods of analyses of the Society. The applicant for the full referee certificate must be a university graduate of at least a four-year course in chemistry, and have had three years' actual experience analyzing products covered by the Society's methods.... Furthermore all applicants for referee certificates of any kind must be able to pass satisfactorily any of the examinations of the Referee Examining Board." In accordance with this change in referee certificates the report of the Referee Board of 1926 was changed so that its rules would include the Governing Board's recommendation. The report of the Board was accepted.

Following the matter of Referee certificates, the President brought up the question of Miss Walker and her work on the certification of glasses. He stated that "it is certainly necessary to have correct glasses in connection with reports on that subject," and recommended that the Governing Board be allowed to continue the work until January 1. A motion to the effect that the "Governing Board have the power to limit this work" was adopted.

After the report of the Refining Committee by Mr. Cluff, Mr. Barrow spoke in praise of the work of the committee and a motion was made and carried that it be given a vote of thanks. All the recommendations made by this Committee were sent to the Uniform Methods Committee except the last one, which considered the question of putting all purely development work of the Committee into the hands of an investigator, who could give practically his whole time to the work until finished. After some discussion of the matter, a motion was carried that gave the Governing Board the power to carry out this recommendation of the Refin-

The above proceedings contain no reference to papers read, as those have been fully covered elsewhere in the Journal. The purpose of this account merely is to present business matters considered at the Convention.

ing Committee in co-operation with the Interstate Cottonseed Crushers' Association.

The first day closed with the appointment of the following committees by the President: Committee on President's address, Messrs. Porter, Schwartz and Cornam; nominating committee, Messrs. Vollertsen, Hutchins, and Cluff; auditing committee, Messrs. Cox, Pelofsky and Evans; resolution committee: Messrs. Battle, Barrow and McLeod.

Early on the following day, Mr. Cluff, after giving the report of the Revision Committee, recommended to the Convention that the abstract of revisions being prepared by the Committee be published in loose-leaf book form. The President raised the question of cost, saying that with a printing of 300 copies, each one would have a value of about three dollars. A motion was carried, however, to permit a committee to investigate the printing and cost of the book, followed by another motion permitting the Governing Board to see that the investigation be carried on and that when the price per book became determined, to manage its sale not only to members but to other chemists as well.

The President then opened a discussion in connection with the Governing Board recommending a standard set of glasses for the Referee Chemists, the set to consist of the fractions of red glasses .1 to .2 on up to .9, the units from one to twelve and the 16-14-20 red, and the yellow glass set of 1-2-3-5-10-15-20 and 35. Another suggestion of the Board that was brought up at this time also was that only three glasses be used in reading any color up to 12.9 and four for any color over that. In answer to Mr. Helm's question of how one would read fifty red with the glasses named, the President stated, "If you have two twenties and a ten you can get your fifty. That will be four just the same. This standard set is not a maximum, but it is a minimum. There is no reason why you cannot have 100 twenties if you want them, but you must at least have this one set standardized, and that you use three glasses up to 12.9 and four thereafter." Mr. Dunkee offered an amendment to the suggestion that a seventy-yellow glass be added in the official color glasses, but it failed of appproval and the matter was dropped.

Following reports by Miss Walker and Mr. Priest of work done on the Standardization of Lovibond Glasses at the Department of Commerce, the Conventon gave them a rising vote of thanks for their co-operation.

In the absence of Mr. Moore, chairman of the Reward Committee, the President reported the results of the contests for efficiency in the determination of both oil and ammonia, and the Conventon then went on record, by means of a rising vote, as being grateful to Mr. Moore for the work he did under unexpected difficulties.

Several of the associate members of the Society explained their ovens. Mr. Boyer merely stated that his oven sold for $130, but Mr. Pitann of the Precision Scientific Company explained that both copper and monel were used in making an oven which sells for $150. He recommended monel because of better facilities for securing it and of less labor difficulty in handling it.

Dr. David Wesson presented a brief survey of the life of Robert

Hulme in which he praised his work and his personality and requested that the brief outline of the man's life, as presented, be incorporated in the minutes of the Convention and a copy sent to his widow. The Convention carried out these desires.

The Auditing Committee reported that the Treasurer's books were in order, and the nominating committee announced the candidates, all of whom were elected, as noted elsewhere in this issue. The Resolution Committee presented its resolutions extending gratitude to numerous men throughout the country who had helped the Society during the year, all of which were accepted by the Convention.

Just before the final adjournment of the gatherng, Mr. Richardson noted that during the past year improvements had been made on Kries' test for the determination of rancidity, that Government chemists had been giving it more attention, and that investigating consumers were becoming interested in it. In view of these facts, Mr. Richardson moved that a committee be appointed to investigate the value of the Kries test as an index of the degree of rancidity of fats and oils. This motion was carried.

Report of the Du Bosq Colorimeter Committee

BY DAVID WESSON, CHAIRMAN

SOMETHING over a year ago Mr. Priest and the writer while dining together at the Cosmos Club in Washington, discussed the problem of color readings and color glasses. It was suggested that by using a standard color glass for prime oil, of 35 Y., 7.6 R., and varying the depth of oil we could avoid having the large number of unsatisfactory glasses as at present in use.

Some time later in Mr. Priest's Laboratory we tried several oils in a DuBosq instrument, and apparently it was possible to read colors of oils ranging from white to crude in terms of prime summer yellow. It seemed a beautiful idea to assume prime summer yellow of an established standard as one hundred, and read off the color of an oil matched against it in percentage by varying the lengths of column and measuring the same.

Thus a choice oil might show 80% color, white oil 15 to 20%, and off oil anywhere from say 105 to 500%, and a crude oil 1000% more or less.

Mr. Priest made a number of experiments in his laboratory and reported verbally that the difference in hue made matching very difficult.

We have the same trouble with Lovibond glasses so it was decided to give the instrument a trial.

Duplicate sets of twelve samples of oils giving a considerable range of color were sent to five laboratories with requests for Lovibond color readings. These were obtained from four laboratories.

Three laboratories were equipped with DuBosq instruments, and the results found by all are given in the following table:

COMPARATIVE LOVIBOND AND DuBOSQ RESULTS

Lab. No.		1 Y	1 R	2 Y	2 R	3 Y	3 R	4 Y	4 R
1	P. S. Y.	35	7.9	35	7.6	35	6.8	35	8.
2	Choice S. Y.	35	4.4	35	4.5	35	3.8	35	4.5
3	Same as No. 1	35	7.9	35	7.6	35	7.3	35	8.
4	Filtered Y. Oil	35	4.6	35	4.4	35	4.35	35	4.4
5	Off S. Y.	35	9.4	35	9.5	35	8.	35	9.5
6	Off S. Y.	35	18.4	35	32.3	35	18.	35	37.
7	Off S. Y.	35	38.	35	60.	35	52.60	35	50.
8	Crude	35	Too dark.						
9	Prime S. W.	20	2.6	20	2.2	20	2.15	20	2.6
10	Wesson Oil	16	1.6	14	1.4	15	1.30	18	1.8
11	Bleached & Deodorized Y. Oil	30	3.	35	3.5	35	3.	35	3.5
12	P. S. Y.	35	7.5	35	17.7	..	....	35	7.6

DuBOSQ RESULTS

Color Per Cent		Lab. No. 3	4
1	P. S. Y.	97.50	106.
2	Choice S. Y.	45.	67.3
3	Same as No. 1	84.2	111.
4	Filtered Y. Oil	38.5	40.6
5	Off S. Y.	135.	145.
6	Off S. Y.	182.	317.
7	Off S. Y.	245.	575.
8	Crude	656.	1470.
9	Prime S. W.	101.	100.
10	Wesson Oil	71.	87.
11	Bleached & Deodorized Y. Oil	123.	*168.
12	P. S. Y.	.....	100.

*Against P. S. Y. No. 387.

The results speak for themselves. The Lovibond readings show differences between different laboratories, which can, doubtless, be traced to differences in glasses and the eyes of the observers.

The differences in readings of the DuBosq instruments are partly inherent in the fundamental principles of the application of the instrument as well as in variations in color sensitiveness of the observers.

In using the DuBosq instrument for comparing two oils, we have the same old problem we have always been up against, viz., tint or hue and darkness due to light absorption.

The actual amount of color present in prime or choice yellow oils simply refined with alkali is comparatively easy to measure, but when the color has been modified by bleaching or deodorization and the oil is compared with an alkali refined oil we have different hues and different light absorption that make it very difficult to secure a match.

It was also found that it was possible to get different results by using different depths of liquids. For instance, using prime summer yellow as a standard, in a 20 mm. column, a filtered yellow oil showed 49.4% color, while with a 40 mm. column for the standard the same oil gave a value of 56%.

To test this matter still further a P. S. Y. reading 35 Y., 7.6 R. was taken as a standard using different columns to compare with a choice S. Y. reading 35 Y., 4.6 R. The results are given in the following table:

P. S. Y.	Choice S. Y.	Color Per Cent
10 m.	12.5 m.m.	80
20 m.	25.6 m.m.	78
30 m.	41.5 m.m.	72.5
40 m.	58.1 m.m.	70
50 m.	69.4 m.m.	70

It seemed quite evident from these results that the depth of column makes a marked difference. This is brought out in reading the differences between laboratories 3 and 4. Laboratory 3 used short columns and varied the depths of both columns to make a match. Laboratory 4 used fairly deep columns and varied the sample but did not vary the standard.

The results are the means of five readings.

Conclusion

1. The DuBosq Colorimeter is a beautiful instrument for measuring the relative amounts of the same coloring matter in two different liquids, providing the liquids are optically the same, and the coloring matter the same in both liquids.

2. Cotton Seed Oils contain several different coloring matters.

3. The effects of decomposition of the seed and the various conditions used in refining processes affect the light absorption of the oils, and the characteristics of the color.

4. These differences are made painfully apparent by the DuBosq instrument.

5. It seems quite apparent, considering the limitations of the human eye and the great differences of hue and brilliancy of different oils, that any system of numerically recording color differences must allow reasonable tolerances.

6. Although results to date appear discouraging, it is believed that by the aid of a modified DuBosq instrument a satisfactory practical method of oil colorimetry may yet be developed if carefully worked out.

When Pete's Wife Broke Her Leg

This young Texas cowboy had spent his life on the Western range. His were the instincts of the cattle man, his the experiences of one who rides behind the long horn through all the seasons. Cows were his life, and all he knew that was of any account was his knowledge of cows.

And then he got married. He brought home a wife from the neighboring county where he had gone to ride in a rodeo, and he exhibited his female pride with all the gusto of the male of the species. And they got along fine. Every one that saw them told of their devotion and their happiness. There was not a cloud on their horizon, it seemed, and the whole world smiled at them.

But one day the young bridegroom came rushing over to the ranch-house of his nearest neighbor, and there were tears streaming down his cheeks, sobs fairly bursting his breast, and he dropped onto the neighbor's porch manifesting every emotion that spelled distress in large letters. The shocked neighbor came running to him, raised his head, and inquired the trouble.

Pete sobbed. "It's the wife," he finally gulped out, "She fell down stairs this morning and broke her laig, and Oh! How I hated to shoot her!"—*Patchwork.*

Statistics of Fats and Oils

Preliminary Report of Department of Commerce

THE Department of Commerce announces that the factory production of fats and oils (exclusive of refined oil and derivatives) during the three-month period ended March 31, 1928, was as follows: Vegetable oils, 789,-210,195 pounds; fish oils, 8,939,097 pounds; animal fats, 718,879,608 pounds; and greases, 106,458,650 pounds; a total of 1,623,487,550 pounds. Of the several kinds of fats and oils covered by this inquiry, the greatest production, 612,-931,016 pounds appears for lard. Next in order is cottonseed oil with 434,067,525 pounds; linseed oil with 223,750,569 pounds; tallow with 104,196,488 pounds; coconut oil with 75,934,932 pounds; and corn oil with 33,552,495 pounds.

The production of refined oils during the period was as follows: Cottonseed, 406,457,026 pounds; coconut, 74,534,522 pounds; peanut, 2,406,030 pounds; corn, 28,798,330 pounds; soya-bean, 2,033,794 pounds; and palm-kernel, 3,693,306 pounds. The quantity of crude oil used in the production of each of these refined oils is included in the figures of crude consumed.

The data for the factory production, factory consumption, imports, exports, and factory and warehouse stocks of fats and oils and for the raw materials used in the production of vegetable oils for the three-month period appear in the following statements:

PRODUCTION, CONSUMPTION AND STOCKS OF FATS AND OILS

(In some cases, where products were made by a continuous process, the Intermediate products were not reported)

Kind	Factory operations for the quarter ended Mar. 31, 1928 Production (pounds)	Consumption (pounds)	Factory and Warehouse stocks Mar. 31, 1928 (pounds)
Vegetable Oils:[1]			
Cottonseed, crude	434,067,525	439,414,435	124,729,795
Cottonseed, refined	406,457,026	303,478,126	541,639,727
Peanut, virgin and crude	5,324,258	3,652,197	3,297,964
Peanut, refined	2,406,030	1,697,366	1,764,046
Coconut, or copra, crude	75,934,932	148,819,416	99,053,081
Coconut, or copra, refined	74,534,522	69,004,697	12,853,129
Corn, crude	33,552,495	34,693,802	14,617,770
Corn, refined	28,798,330	6,077,636	12,869,151
Soya-bean, crude	1,289,082	4,334,469	4,825,709
Soya-bean, refined	2,033,794	1,048,926	1,803,983
Olive, edible	1,012,886	603,659	4,626,735
Olive, inedible	13,094	2,186,291	1,100,085
Sulphur oil, or olive foots	.....	8,573,069	2,952,521
Palm-kernal, crude	.....	13,167,843	4,766,207
Palm-kernel, refined	3,693,306	4,048,656	1,429,098
Rapeseed	.....	3,614,166	5,643,931
Linseed	223,750,569	112,198,913	237,517,185
Chinese wood or tung	.....	22,209,352	17,946,553

Chinese vegetable tallow	.....	1,292,455	1,127,320
Castor	13,854,098	6,370,133	4,199,330
Palm	.....	40,939,714	32,901,591
All other	411,156	2,605,870	2,777,729
Fish Oils:[1]			
Cod and cold liver	346,845	5,074,014	7,114,412
Menhaden	56,517	12,091,270	14,608,673
Whale	105,000	16,048,030	34,640,883
Herring, including sardine	8,341,620	9,363,757	27,735,583
Sperm	.....	204,120	3,163,649
All other, including marine animal	89,115	6,348,855	885,032
Animal Fats:			
Lard, Neutral	21,016,071	7,129,331	9,294,112
Lard, other edible	591,914,955	5,719,097	138,200,803
Tallow, edible	10,299,852	7,582,074	3,590,125
Tallow, inedible	93,896,636	137,994,707	78,419,902
Neat's-foot oil	1,752,104	1,729,961	1,407,410
Greases:			
White	27,414,970	8,837,251	8,345,270
Yellow	20,253,638	11,850,898	8,392,086
Brown	11,686,768	16,017,520	7,130,305
Bone	5,087,318	72,549	1,344,843
Tankage	14,689,042	231,206	3,693,073
Garbage or house	21,707,772	17,865,996	15,252,120
Wool	1,641,056	1,576,716	3,264,344
Recovered	643,604	960,934	925,740
All other	3,334,482	1,596,436	2,906,976
Other Products:			
Lard compounds and other lard substitutes	306,955,624	2,593,119	26,349,509
Hydrogenated oils	137,753,296	139,114,966	12,660,211
Stearin, vegetable	4,201,260	4,094,253	2,236,833
Stearin, animal edible	15,960,655	13,803,410	4,682,222
Stearin, animal, inedible	5,274,680	4,849,607	4,700,958
Oleo oil	30,457,907	10,923,542	9,136,620
Lard oil	6,461,055	4,478,679	4,127,536
Tallow oil	2,266,669	1,757,681	1,916,229
Fatty acids	28,037,773	30,944,455	5,542,381
Fatty acids, distilled	9,511,589	7,710,908	3,937,996
Red oil	15,647,940	5,438,529	9,632,687
Stearic acid	11,973,869	4,211,719	5,004,826
Glycerin, crude 80% basis	34,235,597	33,291,399	19,050,121
Glycerin, dynamite	12,369,306	4,656,072	18,561,971
Glycerin, chemically pure	14,961,919	2,024,774	6,428,454
Cottonseed foots, 50% basis	61,335,078	62,285,393	45,168,662
Cottonseed foots, distilled	29,086,548	27,192,938	5,468,199

(1) The data of oils produced, consumed and on hand by fish oil producers and fish canners were collected by the Bureau of Fisheries.

Other vegetable oil foots	23,979,612	20,492,984	1,940,874
Other vegetable oil foots, distilled	201,439	347,385	167,965
Acidulated soap stock	19,321,653	11,651,504	16,253,147
Miscellaneous soap stock	29,983	139,872	179,209

Raw Materials Used in the Manufacture of Vegetable Oils

Kind	Tons of 2,000 pounds Consumed Jan. 1 to Mar. 31	On hand Mar. 31	Kind	Tons of 2,000 pounds Consumed Jan. 1 to Mar. 31	On hand Mar. 31
Cottonseed	1,344,342	261,944	Flaxseed	332,777	119,306
Peanuts, hulled	5,344	634	Castor beans	15,624	1,822
Peanuts, in the hull	4,068	115	Mustard seed	266	1,164
Copra	62,844	9,744	Soya beans	5,139	3,732
Coconuts and skins	850	37	Olives	4,527	.....
Corn germs	57,407	407	Other kinds	789	1,970

Imports of Oil Seeds, Quarter Ended March 31, 1928

Kind	Tons	Kind	Tons
Cotton seed	112	Poppy seed	937
Castor beans	11,336	Perilla and sesame seed	2,148
Copra	49,772	Other oil seeds	4,002
Flaxseed	115,253		

Imports of Foreign Fats and Oils, Quarter Ended March 31, 1928

Kind	Pounds	Kind	Pounds
Tallow, edible	6,722,317	Palm oil	26,475,503
Other animal oils and fats edible	830,798	Palm-kernel oil	9,738,736
Whale oil	26,666,528	Sesame oil	1,111,085
Cod oil	2,184,712	Vegetable tallow	1,672,453
Cod-liver oil	4,193,648	Vegetable wax	927,965
Other fish oils	12,209,468	Cornauba wax	1,555,994
Wool grease	2,336,366	Peanut oil	1,851,111
Grease and oils, n. e. s. (value)	$47,036	Rape (colza) oil	4,854,952
Olive oil, edible	18,961,876	Linseed oil	82,212
Chinese wood oil or nut oil	22,345,327	Soya-bean oil	5,310,799
Coconut oil	75,910,674	Other expressed oils	828,319
Sulphur oil or olive foots	7,075,783	Glycerin crude	587,158
Other olive oil, inedible	2,826,941	Glycerin, refined	967,069

Exports of Foreign Fats and Oils, Quarter Ended March 31, 1928

Kind	Pounds	Kind	Pounds
Animal oils and fats, edible	5,116	Palm and palm-kernel oil	2,087,648
Fish oils	140,898	Peanut oil	8,266
Other animal oils and fats, inedible	217,057	Soya-bean oil	109,400
Olive oil, edible	43,582	Other expressed oils	198,080
Chinese wood oil or nut oil	1,213,300	Vegetable wax	170,105
Coconut oil	2,643,240		

EXPORTS OF DOMESTIC FATS AND OILS, QUARTER ENDED MARCH 31, 1928

Kind	Pounds	Kind	Pounds
Oleo oil	15,034,627	Cotonseed oil, crude	23,923,173
Oleo stock	1,738,792	Cottonseed oil, refined	3,241,524
Tallow	544,663	Corn oil	89,047
Lard	230,460,786	Vegetable oil lard compounds	1,411,716
Lard, neutral	8,199,961	Other edible vegetable oils and fats	951,936
Lard compounds, containing animal fats	1,477,847	Coconut oil	5,793,201
Oleo and lard stearin	816,950	Linseed oil	496,059
Neat's-foot oil	300,916	Soya-bean oil	1,914,434
Other animal oils, inedible	152,385	Vegetable soap stock	1,792,090
Fish oils	284,156	Other expressed oils and fats inedible	2,101,826
Grease stearin	438,126	Glycerin	409,331
Oleic acid, or red oil	1,353,057		
Stearic acid	381,779		
Other animal greases and fats	21,970,532		

Revision Committee Prints New Rules

THE convention report of the Committee on Revision of Methods of Analysis of the American Oil Chemists' Society states that "Our present Methods for 1927-28 have been thus revised and sample copies printed." The complete report is given below because it contains interesting information.

"This Committee (composed of E. R. Barrow, W. H. Irwin and C. B. Cluff, Chairman) was appointed to eliminate from our Methods all reference to Trading Rules, leaving merely a description of procedure, and to simplify the wording where possible. Its duties were merely editorial and no changes in procedure are made by this Committee. The object of this work was to put the Methods into such shape that they could be adopted and recommended by the American Chemical Society for universal use by all chemists concerned with analyses of any kind where these Methods will apply, even though such chemists are not concerned with cottonseed products or Interstate Rules.

"Our present Methods for 1927-28 have been thus revised and sample copies printed. Suggestions for improvement will be welcomed. A few changes in procedure will undoubtedly be made at our 1928 meeting, after which it is proposed to have the complete, up-to-date Methods reprinted in pamphlet form, as the official Methods of this Society, omitting the Interstate Rule numbering. They will then be obtainable from our Secretary at a small charge.

"While Rules 260, 261, 262, 263 and 264 in Chapter XII have been printed with the sample copies as a matter of convenience, it is not intended to include these in the final edition, as they relate only to settlements of trades, specifying which refining test to report, etc., and they can be found in the Interstate Rule Book by those who need them.

"It has been suggested that we should also have the 'Standard Methods for the Sampling and Analysis of Commercial Fats and Oils' of the American Chemical Society printed in the pamphlet."

Organic Peroxides as Bleaching Agents

Their Application in the Oil and Fat Industries

BY F. VISSER'T HOOFT

BLEACHING is the art of eliminating coloring matters from products which generally have a vegetable or animal origin.

The methods used in bleaching are mostly oxidations or reductions by which the coloring matters are changed into colorless compounds which are either harmless or which can be eliminated easily. Besides these methods we have bleaching methods by adsorptive means.

It may be well to mention here the words of Lewkowitsch who says: "Too much stress cannot be laid on the necessity of regarding the bleaching of each individual oil or fat as a problem *sui generis*, and of recognizing that the processes adopted on a manufacturing scale must vary greatly with the nature of each individual oil or fat."

Coloring Matters in Oils

In solving the problem of bleaching a certain oil we first must try to determine the exact nature of the coloring matters. Unfortunately the chemistry of these substances is still a field wide open for speculation. In animal and vegetable tissues we find in the cells, together with the oil, coloring pigments which are named chromolipoids. This name is to be preferred over the old name of lipochromes (See Palmer, Carotinoids and Related Pigments. p. 18).

The red or yellow color of a refined oil or fat is for the greater part due to these chromolipoids. Very few of these chromolipoids are known in the chemically pure state. Tswett distinguishes a class of chromolipoids which he calls carotinoids and in which he brings all the various chromolipoids which are chemically and generically related to carotin. He designates as carotins all those chromolipoids whose constitution and properties show them to be hydrocarbons and as xanthophylls all those whose constitution and properties show them to be oxy-hydrocarbons and which are chemically, as well as generically, related to carotin. Palmer also adopts this terminology in his book: "Carotinoids and Related Pigments." (A. C. S. Monograph Series)

The two carotinoids which are best known as defined chemical individuals are carotin and xanthophyll. Carotin has the formula $C_{40}H_{56}$; Xanthophyll has the formula $C_{40}H_{56}O_2$.

Both of these substances are highly unsaturated and carotin is reported to be able to absorb twelve atoms of oxygen in its molecule. This oxidation is at the same time a bleaching. The characteristic red or yellow color disappears entirely.

Carotin, especially, is one of the principal coloring matters in the ordinary refined oils and fats. Therefore, we will study this substance a little closer.

Solutions of carotin are unaffected by boiling with alkalies, and therefore the refining of an oil does not destroy the carotin. Carotin cannot be absorbed easily by finely divided substances. Palmer describes his experiments with various decolorizing carbons.

In strictly adsorption experiments in which there was no indication that decolorization was due in part to oxidation of the carotin, he found that at least 12.5 grams of the most effective carbon so far obtainable was required to completely absorb the carotin out of 100 grams of fat.

In view of the above stated properties of carotin, which to a certain extent are also the properties of many other chromolipoids, the best way to destroy color due to one of these substances is through oxidation. The oxidation products of these substances are colorless; in other words through oxidation the intense red or yellow color can be bleached entirely.

Bleaching by Oxidation

It is not my intention to give a complete survey of all the different oxidation bleaching methods because these are described more competently and in detail in the various handbooks.

I will here describe a method which has not received much attention because the chemicals used are relatively rare. This process uses the organic peroxides as oxidation agents.

Organic peroxides may be considered as derivatives of hydrogen peroxide (H-O-O-H) in which one or both hydrogen atoms are replaced by a single or bivalent group, or even a more complex structure. The best known organic peroxide is benzoyl peroxide with the correct scientific name of di-benzoyl peroxide.

Di-benzoyl-peroxide is a crystalline substance with a melting point of 103.5°C. It is soluble in oil. Although many other organic peroxides are equally interesting from a chemical standpoint and research work on them is at present in progress, we will restrict ourselves here to benzoyl peroxide. Formerly this compound belonged to the rare chemicals, but at present it is manufactured on a large scale. Its use as a flour bleach is patented, and a product containing benzoyl peroxide is obtainable in the market, as is pure benzoyl peroxide also.

In working out a satisfactory method for the bleaching of an oil with benzoyl peroxide, three factors have to be determined.

1. Percentage to be used.
2. Temperature at which best results are obtained.
3. Time in which best results are obtained.

1. The percentage of benzoyl peroxide to be used varies from 0.05% to 0.2%. By running a series of bleaching tests on small samples of oil, varying this percentage and keeping temperature and time the same in all the tests, the most economical percentage can be determined.

2. A temperature of 80°-90°C. gives as a rule the best results. At higher temperatures a slow decomposition of the benzoyl peroxide starts and there is a loss of bleaching strength. Sometimes lower temperatures give better results.

3. The time of the treatment varies greatly with the nature of the oil. Sometimes a twenty minute heat treatment is sufficient. Sometimes even after a few days an after-bleaching effect is seen.

The method of bleaching is very simple, and can be outlined as follows. After determining the above three factors in the laboratory, a factory batch of oil is heated to the right temperature. In the meantime, the necessary amount of benzoyl peroxide is made into a paste with a small portion of the oil, until all the lumps are pulverized. Then the mixture is added to the heated oil, care being taken that all benzoyl peroxide is dissolved before more paste is added. A thorough stirring is necessary. Benzoyl peroxide is very soluble in oil, but it must be remembered that only the benzoyl peroxide in actual solution can produce the desired bleaching effect. Therefore, any particles which might not dissolve will decrease the efficiency of the process. After stirring for the necessary period, the oil can be left to itself. As no deposits are formed, no filtering is therefore necessary. This makes the benzoyl peroxide treatment stand out from all other bleaching processes, all of which make it necessary to eliminate precipitates or emulsions which are formed, resulting in inevitable loss of fat or oil. After the benzoyl peroxide has produced its bleaching effect and lost its available oxygen, there remains a small amount of benzoic acid. Because of its great volatility, the greater part of this benzoic acid disappears in the bleaching process. The remaining amount is so small that it can hardly be detected, and especially after steaming or deodorizing the oil, there is no trace of benzoic acid left.

At present research work is being done on a great many oils and fats, in connection with the organic peroxides. The writer hopes to be able to publish further results soon.

Recommendations of the Uniform Methods Committee

THE Uniform Methods Committee, composed of N. C. Hamner, chairman, W. H. Irwin, J. J. Vollertsen, and G. W. Agee, made the following recommendations to the American Oil Chemists' Society Convention at New Orleans after the various papers had been read:

1. We recommend the adoption of the Refining Committee report.

2. We recommend the adoption of the report of the Moisture Committee.

3. We recommend that in the determination of free fatty acids in oil extracted from meats or seed, that Phenolthallein be used as the indicator.

4. Reference is made to the report of the Corn Oil Committee; we recommend that this report be accepted as a progress report and referred to the new Committee.

5. Referring to the communication or report from Mr. Thurman of the American Linseed Oil Co., we recommend reference to the Fat Analysis Committee for their consideration.

6. Reference to Committee on Color of Cake and Meal: we recommend adoption of the report.

7. We recommend adoption of the report of the Committee on Color of Oil and suggest further study of this problem.

8. Reference is made to report of the Sampler Committee; we recommend acceptance of this report and suggest that the recommendation regarding certificates is a matter which should be properly acted on by the Rules Committee of the Interstate.

Book Reviews

TARIFF ON OILS

THE TARIFF ON ANIMAL AND VEGETABLE OILS. By Philip G. Wright—The Institute of Economics, 12mo. XVIII—379 pp. The MacMillan Company, New York.

The problem discussed in this book first came to public notice at the time of the passage of the Tariff Acts of 1921 and 1922, and has since constituted one of the most difficult of the problems of the tariff-making authorities. The commodities discussed include the principal vegetable oils and animal fats.

The author has been employed in former years as an expert with the U. S. Tariff Commission and is widely known as an economist.

In this work, under the guidance of The Institute of Economics, he has presented in able fashion the elements of the problems involved in the establishment of import duties on each of our important oils and fats.

He has also presented the case for and against such duty in the instance of each oil or fat considered and, incidentally, has given a splendid summary of the production and uses of each such oil.

Through the delineation of facts, without bias, Mr. Wright has shown that our present relatively high duties on oil and fats have rendered but little aid to the farmer, and have actually injured the other class which they were designed to protect; that is, the domestic crushers and refiners of vegetable oils.

The book presents a wealth of statistical data but presents it in such a way that it makes most interesting reading to oil men.

We heartily recommend this work to all who desire to gain a comprehensive view of the position of the oils and fats in the economy of America, and indeed, of the world.

FOOD RESEARCH STUDIES

FATS AND OILS STUDIES OF THE FOOD RESEARCH INSTITUTE: NUMBER 1, THE FATS AND OILS, A GENERAL VIEW. By Carl L. Alsberg and Alonzo E. Taylor, 8vo. VIII—103 pp. Stanford University Press, Stanford University, California.

In this, the introductory volume of the Fats and Oils Studies Series, the authors, each distinguished in his chosen field, chemistry and economics, respectively, have set forth the story of fats and oils in such terms as are readily comprehensible by the reader who lacks contacts with the technical phases of the materials discussed.

The nature and sources, properties and technology of oils and fats, edible and industrial, are clearly outlined; then the conditions and trends of production and consumption are intelligently discussed.

The first half of the study should be read carefully by all who trade in oils or fats, that they may grasp the nature of the materials they barter, and the second half by all workers in the production branches of the industries, chemists included, that they may appreciate the larger economic phases of World trade in oils and fats.

The clear and logical methods of presentation will hold all readers having any contact whatsoever with the fat and oil industries.

The American Oil Chemists' Society

Notes and Correspondence

Standardization of Lovibond Glasses

(Investigation in Cooperation with A.O.C.S.)
Report For April, 1928

BY IRWIN G. PRIEST,
Chief, Colorimetry Section

(Names in parentheses at the ends of paragraphs indicate individuals principally responsible for the work described.)

I. Report on Investigation of Sixty-five 35-Y Glasses Submitted by A.O.C.S. in August, 1927.

Informal report on these glasses was made to Messrs. Trevithick and Putland, April 14th. They were shown a table of the essential results. Since then, more extensive tables to illustrate the report have been prepared. The final issuance of the formal report has been delayed because of the great amount of time given to preparation for the color sense tests to be undertaken for the A.O.C.S. at its New Orleans meeting.

Progress has been made in plotting the spectral transmission curves of these glasses for the purpose of intercomparing them and to afford a comparison of differences in spectral curves with corresponding differences in colorimetric characteristics. (Priest, Walker, Gibson, Banker).

II. Calibration of Fractional Yellow Glasses in Bureau of Standards Set, B. S. 9940.

Spectral transmission measurements have been completed and data adopted as standard (including transmission at intervals of 10 millimicrons from 380 to 750 and also for mercury wave lengths:— 404.7; 435.8; 491.6; 546.1; 578) for the following glasses (maker's numbers) in the set, B. S. 9940: 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.10, 0.20, 0.30, 0.40, 0.50, 0.60, 0.70, 0.80, 0.90.

The following colorimetric characteristics have been computed from the above spectral transmission data, checked, and adopted for each of the above mentioned glasses:—

(1) Dominant wave length*
(2) Purity*
(3) Transmission for sunlight*
(4) Transmission for sunlight, on basis of visibility recommended by Gibson and Tyndall.
(5) Lovibond yellow scale numerals on basis of standards established by Priest and Gibson, May, 1927.

Empirical formulas, of practical value in calibrating yellow glasses of nominal value .01 to 10.0, have been developed and tested:

(1) Formulas by which the Priest-Gibson numeral can be computed to a close approximation from the transmissions for only two or three wave lengths in the mercury spectrum.

(2) A formula by which the sunlight transmission can be computed from the Priest-Gibson numeral and the transmission for wave length 546.1 millimicrons (mercury spectrum). (Gibson, Brown, Riley, Hunter).

* O. S. A. Colorimetry Report Standard. May, 1927.

III. Further Calibration of Red Glasses in Bureau of Standards Set, B. S. 9940.

A very elaborate and extensive intercomparison of the red glasses has been conducted by two observers in order to test, by direct color comparison, the consistency of the numerals assigned to the glasses by Priest and Gibson, May, 1927, on the basis of computation from spectral transmission data. The experimental procedure consists essentially in finding combinations of glasses the colors of which match given glasses (or other combinations) from the same set. The test is whether or not the sum of the numerals in one combination is equal to the sum of the numerals in the other combination. If this condition were found in all possible combinations, it would mean that the numerals assigned by Priest and Gibson (on the basis of the spectral transmission data) were perfectly consistent with the data by direct comparison. Actually, of course, there are uncertainties and sources of error to be considered in both sets of data. The degree to which the new direct color match data verifies the Priest-Gibson numerals is most clearly shown by comparing the Priest-Gibson numerals with revised numerals selected to satisfy the color match data. This is done in the following table where N is the maker's numeral, N' is the Priest-Gibson numeral, N" is the revised numeral required by the new color match data.

Attention is invited to the difference column (N"—N'). If the Priest-Gibson numerals were in perfect accord with the new color match data, each difference in this column would be zero. As a matter of fact, the differences are so nearly zero as to be of little or no practical consequence. The maximum difference is so small as to be hardly perceptible with certainty. This investgation has not been carried far enough to justify any revision of the standard scale adopted in May, 1927. It shows, however, that the errors in that scale are vanishingly small from a practical point of view. By contrast, the relatively large and sometimes erratic differences between N"—N show how incompatible the original maker's numerals are wth the color match data. (Judd and Walker).

N	N'	N"	N"—N'	N"—N
0.02	0.104	0.099	— 0.005	+ 0.08
.13	.199	.218	+ .019	+ .09
.18	.296	.298	+ .002	+ .12
.28	.365	.372	+ .007	+ .09
.32	.454	.460	+ .006	+ .14
.38	.495	.515	+ .020	+ .14
.46	.593	.613	+ .020	+ .15
.56	.711	.750	+ .039	+ .19
.64	.806	.849	+ .043	+ .21
.74	.900	.947	+ .047	+ .21
.86	1.003	1.069	+ .066	+ .21
1.8	1.95	2.02	+ .07	+ .22
2.8	2.99	3.03	+ .04	+ .23
3.9	3.94	4.00	+ .06	+ .10
4.9	5.08	5.09	+ .01	+ .19
5.4	5.82	5.86	+ .04	+ .46
6.0	6.53	6.55	+ .02	+ .55
6.8	6.85	6.88	+ .03	+ .08
7.6	7.59	7.60	+ .01	+ .00
8.2	8.04	8.04	.00	— .16
9.0	9.17	9.15	— .02	+ .15
9.8	10.00	10.00	.00	+ .20

The colorimetric purity has been recomputed (more accurately than before) for all of the red glasses (in combination with 35-Y) previously standardized (78 in all); a new graph showing purity as a function of the red numeral (35-Y constant) has been plotted; and a new summary table of purities of these actual glasses and purities proper to their numerals has been prepared. (Gibson and Riley).

Formulas have been derived for computing the trilinear coordinates corresponding to 35-Y N'—R from

values of N' (the Priest-Gibson numeral) and colorimetric purity. The trilinear coordinates for a considerable number of values of N' from 0.0 to 20.0 have been computed and plotted. These formulas and relations developed from them will be of value in the final specification of the 35-Y N'—R scale. (Judd).

IV. Test of Agreement of Different Observers on Routine Grading of Red Glasses.

Practical tests have shown that, in the routine grading of red glasses as now carried on at the Bureau, the values found from single determinations by Dr. Judd and Miss Walker (independently) agree to within about 0.05 R. In 49 determinations, the average difference between the value of Dr. Judd and that of Miss Walker was found to be 0.02. In only three of the 49 determinations was this difference greater than 0.04.

The average difference increases somewhat as the red numeral increases. For red numerals less than unity, it is only 0.013; between one and ten, it rises to 0.024. (Judd, Walker).

V. Red Glasses which Match with 35-Y May not Match Alone, and Vice Versa.

All of the standardization of red glasses carried on for the A.O.C.S. at the Bureau has been based on comparison of red glasses always in combination with 35-Y, because (in grading oils) the red glasses are always used in combination with yellow (usually 35-Y). It was realized that if the red glasses were standardized and calibrated alone, the values so found might not always be exactly effective when used in combination with 35-Y. An illustration of this has been found in one of the glasses recently calibrated (A.O.C.S. No. 388). The effective red numeral of this glass in combination with 35-Y is 6.98; but without the yellow, it is 6.73. This glass is somewhat abnormal; in combination with 35-Y it gives a color less saturated than normal. (Priest, Walker).

VI. Comparison of Calibrations by Direct Color Match and Computation from Spectral Transmission Data for a Somewhat Abnormal Red Glass (A.O.C.S.) No. 388); and a Note on Sensibility to Purity Differences at 35-Y 7-R.

The red glass A.O.C.S. 388, (Maker's engraved numeral, 6.0), mentioned in the preceding section, having been recognized as somewhat abnormal, it was thought worth while to make a special investigation of it. The following data were obtained:

(1) Red numeral on Priest-Gibson scale

(a) By computation from actual spectral transmission of glass 6.98

(b) By direct color comparison in Martens Photometer, "practical match" as in regular routine calibrations,

By Judd 6.97

By Walker 6.98

(2) $P_a—P_{n_1}$ —0.0066 (Obtained by computation spectral transmission where P_a is actual colorimetric purity of this glass in combination with 35-Y and P_{n_1} is the colorimetric purity proper to the red numeral given above.)

(3) Remarks by Judd and Walker on the lack of perfect match in saturation

observed when finding the red numeral by direct comparison with the standard glasses.

In considering these data, the following relations were noted:—

(1) In spite of the abnormal character of this glass the numerals obtained by direct comparison with the standards by two observers and the numeral obtained by computation are all in accurate agreement to within 0.01 R.

(2) The lack of saturation match noted by Judd and Walker was in the direction to be expected from the value of $P_a - P_{n_1}$ given above. (The values of $P_a - P_{n_1}$ for the standard glasses used by Judd and Walker in these comparisons were very small relative to the value for A.O.C.S. No. 388). These observations seem to indicate that purity differences less than 0.01 at 35-Y 7-R are perceptible as saturation differences to Judd and Walker. (Judd, Walker, Priest, Gibson).

VII. Tests of Perceptibility of Differences in Lovibond Red at 35-Y 7.6-R.

In preparation for tests of color sense to be made at the New Orleans meeting, a great deal of time has been spent on making preliminary tests, improving technic, and standardizing the procedure for conducting the experiments to determine perceptibility of differences in Lovibond red at 35-Y 7.6-R for any observer. The improved apparatus has already been mentioned in the Report for March (Sec. VIII). During April, it has been used to make preliminary tests on a number of normal and abnormal observers. Minor improvements have been made in the apparatus and the methods of using it. These subjects will be more fully dealt with in later reports. (Priest, Judd, Walker).

VIII. Rate of Change of Dominant Wave Length with Red Numeral in the Lovibond Scale 35-Y Variable Red.

The Lovibond scale most widely used in grading oils is 35-Y N-R where 35-Y is maintained constant and N is selected to match the oil being graded. In fundamental colorimetric terms this is preeminently a dominant wave lengh scale. As N is increased the dominant wave length increases. (The concomitant change in purity, although not negligible, is of minor importance.) From time to time we have been obtaining data on the derivative $d\lambda\ dN'$ where λ is dominant wave length and N' is the Priest-Gibson red numeral. We have previously obtained values of this derivative:

(1) By computation from the O.S.A. excitation functions,

(2) By direct observation by Priest and Judd.

During April further direct determinations have been made for Judd and one other observer. Further observations are to be made and a more complete report will be made when more observations are available. (Judd, Priest).

IX. Construction of Instrument for Using Lovibond Glasses.

The instrument mentioned in the Report for March (Sec. IX) is being constructed in the Bureau of Standards Instrument Shop and is nearly finished. (Priest).

X. Glasses from the Tintometer, Ltd.

The Lovibond establishment in England, the Tintometer, Ltd., has submitted the following glasses with the request that they be calibrated in terms of our scale (Letter of March 19, received March 29th):

36 red glasses,
30 yellow glasses,
29 blue glasses.

These glasses cover their respective scales from 0.1 to 20.

Recent letters from the Tintometer, Ltd., (February 17th and March 19th) express their desire to co-operate with us in bringing about a standardization satisfactory to their American customers.

XI. Spectral Transmission of Cotton Seed Oil.

The spectral transmission of an oil adopted as standard by Dr. Wesson for tests of the Dubosq colorimeter (Wesson's Sample No. 1) has been determined. (Gibson, Brown).

XII. Progress on Routine Calibration of Red Glasses.

Twenty-four red glasses submitted March 16th have been calibrated, returned and reported. (Date of return to Mr. Putland, April 6th. Date of report, April 14th.)

Twenty-four red glasses submitted March 29th have been calibrated, returned and reported. (Date of return to Mr. Putland, April 17th. Date of report, April 19th.)

Twenty-nine red glasses submitted April 14th have been calibrated. Report was in course of preparation at end of month. (Walker).

XIII. Conference.

Mr. H. P. Trevithick and Mr. A. W. Putland, representing the A.O.C.S., visited the Bureau April 14th and conferred with Mr. Priest and others relative to progress of work.

Detergents Committee Meets in Washington

A FEW weeks before the American Oil Chemists' Society Convention the Detergents Committee met in Washington, D. C., for the purpose of discussing a proposed soiled cloth, a suitable machine, and the tests to be conducted. The conclusions of the ten members of the committee, as reported by its chairman, F. H. Guernsey, follow:

Soiled Cloth: It was agreed that the last traces of soil are hardest to remove and that the number of washes required to completely remove the soil is an index of detergency worthy of trial. The following points were cited in favor of the proposed cloth:

1. Mechanically soiled. (Preferably at one source) Personal equation is largely eliminated.
2. Can be applied on any kind of material.
3. Affords a simple means of measuring detergency. Delicate instruments not required.
4. Soil can be any specific dirt or mixture.
5. The cloth has practical possibilities.

To what extent aging will affect the soil is one of the problems to be studied after the method has been tested. Samples of washed cloth were exhibited. Mr. Appel furnished samples washed in the proposed machine and the Chairman showed samples washed in a commercial laundry.

It was decided that in testing

the method the experiments should be confined to one soil, such as lampblack, instead of complicating matters by adding kaolin or other proposed soils. The only change to be made at present in the soiling mixture is the substitution of colorless Nujol for the A.O.C.S. mineral oil. The lampblack is to be No. 14 manufactured by Seaver & Company of Boston.

The composition of soil after drying will be:

Wheat Starch	56.82
Gum Tragacanth	3.41
Tallow (A.O.C.S.)	11.36
Nujol Oil	11.36
Lampblack	17.04
	99.99

Machine: It was agreed that last year's machine was unsuitable for this work. A small machine resembling a commercial wheel was exhibited by the Chairman for the purpose of emphasizing the advantages of Mr. Appel's machine.

The merits of Mr. Appel's machine were very readily noted. It consists essentially of a battery of twenty pint jars revolving at a definite speed in a water bath which is kept at constant temperature. In each jar fifteen rubber balls (d=3.2) are placed with a piece of standard soiled cloth three inches square in 100 cc. of solution. The speed of the jars should be in the neighborhood of fifty-two R.P.M. to insure greatest action.

The Research Committee of the American Association of Textile Chemists & Colorists are planning to have several of these machines made. If the Detergents Committee have machines made up jointly with them, the price will undoubtedly be much lower. The machines are not to be equipped with a driving mechanism or motor by the manufacturer, for it will be up to the individuals to adjust the machines to the specified R.P.M.

Tests: The following represents the conditions under which the method is to be tested:

1. The soap will be furnished by the Chairman. It will have a titre of about 38 degrees. The percentage is not to be calculated on a bone dry basis. The strength of the solution is to be .2% soap (soap as received taken as 100%).

2. The cloth samples are to be three inches square and cut in the same manner as a sample which will accompany the cloth.

3. A twenty-minute suds followed by two five-minute rinses (all at 160°F.) will constitute one wash. Distilled water is to be used throughout and all solutions are to be heated to temperature before use. The volume of solution in all cases will be 100 cc.

4. In each jar 15 balls are to be placed together with the cloth and 100 cc. of solution.

5. In conducting the test a piece of the cloth is placed in each of 10 jars. At the end of each wash one of the pieces is removed. After drying and ironing the samples are to be mounted on black cardboard. The number of washings corresponding to the piece which no longer shows any visible trace of the soil is to be recorded as the index of detergency.

6. A duplicate test will be independently run within three days. To check up on aging, it is very important that the date of both runs be recorded.

The above procedure under uniform conditions will undoubtedly test this proposed method, and if found favorable a more elaborate and practical set of experiments will follow.

Financial Statement

American Oil Chemists' Society

THE statement of the resources, liabilities, and membership of the American Oil Chemists' Society for the year ending April 30, 1928, as prepared by J. C. P. Helm, secretary-treasurer of the American Oil Chemists' Society, follows:

RESOURCES

Cash:			
Savings account	$1,014.58		
Checking account	412.91		
On hand	5.01		
			$1,432.50
Bonds and Securities:			
Liberty Bonds	$400.00		
Bonds of Chicago Med. Arts Bldg.	1,500.00		
			$1,900.00
Bills Receivable:			
For Color Glasses Standardized:			
Armstrong Packing Co., Dallas, Texas	$4 50		
Palm Olive Peet Co., Kansas City, Kans.	1 50		
Lever Bros. Co., Cambridge, Mass.	1.59		
The Battle Laboratories, Montgomery, Ala.	3.00		
Harris Abattoir, Ltd., St. Boniface, Canada	4.50		
Felix Paquin, Galveston, Texas	1 50		
Van Camp's Louisville, Ky.	6 00		
General Laboratories, Oklahoma City, Okla.	1 59		
Stillwell & Gladding, New York City	4.50		
Landon C. Moore, Dallas, Texas	3 00		
L. B. Forbes Labs., Memphis, Tenn.	1.50		
Chas. W. Rice, Columbia, S. C.	6.00		
Barrow-Agee Labs., Memphis, Tenn.	3 00		
Texas Testing Labs., Dallas, Texas	10.50		
Fort Worth Labs., Fort Worth, Texas	4.50		
		$57.00	
For Standard Supplies:			
Lookout Oil & Rfg. Co., Chattanooga, Tenn.	$1 10		
Oil Processes Inc., Harrison, N. J.	4 00		
Colgate & Co., New York	3 00		
Southern Cotton Oil Co., Memphis, Tenn.	2.24		
J. J. Nesterowicz, Buffalo, N. Y.	.43		
Lehman Johnson Laboratory, Memphis, Tenn.	1.78		
		$12.75	
			$69.75
Standard Set of Lovibond Color Glasses			32 Glasses
Fullers Earth:			
23 4-lb. Cans of 1927-28 Supply.			
Standard Salts			3970 Bottles
Aluminum Moisture Dishes			2500 Dishes

LIABILITIES

Bills Payable:
T. Fitzwilliams & Co., Ltd., N. O., La..... $6.30

MEMBERSHIP

Membership May 1st, 1928:	
Honorary	5
Corporation	31
Active non-paying	1
Active	244
Individual Associate	4
Total Membership all classes.	285
New Members, 1927-28:	
Corporation	6
Active	51
Individual Associate	4
Total Membership Received...	61
Members Lost, 1927-28:	
By death	1
By resignation	7
By suspension for non-payment of dues	12
Total Membership Lost	20
Total Membership:	
May 1st, 1928, was	285
May 1st, 1927, was	251
Showing a net gain of members for the year ending April 30, 1928	34

Committee Determines Iodine Number

IT was found by the American Oil Chemists' Society committee on iodine numbers that 100 per cent excess of Wijs reagent gives iodine numbers three to five units higher than when sixty to seventy per cent excess is used, according to a convention report submitted by B. H. Thurman, chairman of the committee. Other conclusions drawn by this committee follow:

(1) The interchange of carbon tetrachloride and chloroform as solvents makes no difference in the iodine number.

(2) Wijs reagent No. 1 (chlorinated iodine) gave 1 iodine unit higher than Wijs reagent No. 2 ($IC1_3$ plus iodine). This is of no more significance than to say that different Wijs reagents carefully made may give a slight difference. Committee Member "C" stated that his No. 1 reagent was lighter in color than his No. 2, indicating that the former contained more chlorin than the latter. While an excess of iodine does no harm, an excess of chlorin will result in higher than true values, due to chlorin substitution of hydrogen atoms in addition to the simple addition of halogen at the double bonds.

(3) The Average of Committee Members "A" and "B" results shows that the iodine numbers obtained in a cold place were 2 units lower than those run in a warm place. Since chemical reactions proceed at a lower rate when temperature is lowered this is to be expected. However, from the law of mass action we would expect that a sufficient excess of reagent would increase the rate. This is observed in results of Member "C" who used a 100 per cent excess of Wijs reagent; the "Cold" digestions, giving practically the same results as the "Worm" digestions. These facts constitute a strong argument in favor of 100 per cent excess Wijs reagent, namely where it is used, better checks

are obtained and differences due to temperature variations are eliminated, as well as approaching complete saturation of all of the double bonds in the oil.
(According to practice of Professor A. W. Thomas, Columbia).

(4) It is obvious that reporting iodine numbers of this magnitude to the first place of decimals, i. e., to an assumed accuracy of 1 part in 1750, etc., is idle and unscientific. It should be reported to three significant figures only, thus omitting the decimal and doing away with useless figures.

COMMITTEE MEMBERS' RESULTS ON PURE RAW LINSEED OIL

	*** (A) Spencer Kellogg	* (B) Goodrich	** (C) American Linseed	Average of A & B	Average of A, B, & Co.
CCl_4 in cold dark place:					
No. 1	(11.5°C)	(11.8°C)	(9°C)		
	178.4	174.9	181.0	176	178
No. 2	(6.6°C)	(11.3°C)	(9°C)		
	175.2	175.1	180.5	175	177
CCl_4 in warm dark place:					
No. 1	(22°C)	(26°C)	(27°C)		
	177.8	178.5	181.5	178	179
No. 2	(18.2°C)	(25°C)	(27°C)		
	178.2	175.5	181.0	177	178
$CHCl_3$ in cold dark place:					
No. 1	(11.5°C)	(12.8°C)	(9°C)		
	177.9	174.5	181.7	176	178
No. 2	(6.6°C)	(12.3°C)			
	176.5	175.5	181.2	176	178
$CHCl_3$ in warm dark place:					
No. 1	(22°C)	(25.5°C)	(27°C)		
	178.1	177.9	182.0	178	179
No. 2	(18.2°C)	(25.5°C)			
	178.1	176.8	181.6	177	179
	Jan. 26, '28 Agster	Jan. 20, '28 Taylor	Apr. 2, '28 Gwynn		

No. 1—Chlorinated iodin Wijs.
No. 2—ICl and Iodin Wijs.
***(A) used 90% xs Wijs.
*(B) used 0.13-0.15 gm. oil, 60-70% xs Wijs reagent, 1 hr., shaken at start and after one-half hr.
**(C) used 100% xs Wijs reagent.